

heating said substrate;

introducing a feedstock gas having a high temperature-melting point metal in its structure, and a reductive nitrogen-containing gas comprising a nitrogen atom into said vacuum atmosphere; and

forming a film of the nitride of said high temperature-melting point metal on said substrate, wherein said step of forming said film of the nitride includes a plasma-free formation of said film, wherein a nitrogen-free auxiliary reductive gas is introduced into said vacuum atmosphere.

3. (Thrice Amended) [The] A process for producing a barrier film by the heat CVD method, comprising the steps of:

providing a substrate on a substrate holder in a vacuum atmosphere within a CVD apparatus;

heating said substrate;

introducing a feedstock gas having a high temperature-melting point metal in its structure into said vacuum atmosphere; and

forming a film of the nitride of said high temperature-melting point metal on said substrate, wherein said step of forming said film of the nitride includes a plasma-free formation of said film,

wherein a nitrogen-free auxiliary reductive gas is introduced into said vacuum atmosphere, said nitrogen-free auxiliary reductive gas being introduced together with said feedstock gas into said vacuum atmosphere.

8. (Thrice Amended) The process for producing a barrier film by a heat CVD method

according to claim 1, further comprising the steps of: forming a barrier film made of a film of the nitride of a high temperature-melting point metal on a substrate on a substrate holder in a vacuum atmosphere within a CVD apparatus; exposing the surface of said substrate to a plasma of hydrogen gas and a plasma containing at least one gas selected from among argon, nitrogen and helium gases; and then forming the film of the nitride of said high temperature-melting point metal on the surface of the substrate, wherein the step of forming the film includes the step of heating the substrate.

11. (Twice Amended) A process for producing a barrier film which comprises the steps of: providing a substrate on a substrate holder in a vacuum atmosphere within a CVD apparatus; heating said substrate; introducing a feedstock gas having a high temperature-melting point metal in its structure, and a NH_3 gas into said vacuum atmosphere; and forming a film of the nitride of said high temperature-melting point metal on said substrate, wherein said step of forming said film of the nitride includes a plasma-free formation of said film, wherein a reductive Si-containing gas is introduced into said vacuum atmosphere.

13. (Twice Amended) The process for producing a barrier film, comprising the steps of: providing a substrate on a substrate holder in a vacuum atmosphere within a CVD apparatus; heating said substrate; introducing a feedstock gas having a high temperature-melting point metal in its structure into said vacuum atmosphere; and forming a film of the nitride of said high temperature-melting point metal on said substrate,

wherein said step of forming said film of the nitride includes a plasma-free formation of said film,

wherein a reductive Si-containing gas is introduced into said vacuum atmosphere, said reductive Si-containing gas being introduced together with said feedstock gas into said vacuum atmosphere.